App. Serial No. 09/851,757
Docket No.: US018047 US

In the Specification:

At page 7, lines 2-19, please amend the paragraph as follows:

The present invention is a system and method that increases the difficulty of interpreting electromagnetic emissions from a keypad system. The system and method reduces the probability of sensitive key sequences being illicitly associated with electromagnetic emissions by facilitating randomness in the electromagnetic emissions associated with a particular key activation. In one embodiment of the present invention, a keypad scanner circuit utilizes a set of digital values that varies over time and the bits included in a digital word applied to a keypad attribute (*e.g.*, a row or column). The set of random digital values are stored in a register file and are sequentially sent to the column pads and row pads. In one embodiment of the present invention, the set of digital values is generated by either software or a hardware randomizer, and loaded into the register file. The keypad security system of the present invention drives the varying strong keypad driver word to an attribute of a keypad switch matrix (*e.g.*, the rows or columns), applies a weak driver word to the opposing attribute of the keypad switch matrix, retrieves a resulting word from the [[he]] opposing attribute of the keypad switch matrix, and interprets the results to determine if a switch included in a keypad system was activated (*e.g.*, is on or off).

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  At page 7-8, lines 22-24 and 1-14 respectively, please amend the paragraph as follows:

  To support random bit values on each of the matrix attributes, the weak keypad driver signals are independently configured. In one embodiment of the present invention, the weak driver signals are independently pulled up or pulled down. In one exemplary implementation of the present invention, the weak driver signals are independently precharged to a logical value by temporarily enabling the respective opposing attribute driver (*e.g.*, a row or column driver). When the opposing attribute driver enable signal is unasserted after a short temporary duration, a bus keeper coupled to the opposing attribute holds the weak signal. The independent weak signals remain the same unless <u>overcome</u> ~~over come~~ by a strong driver signal due to a keypad switch activation. In one embodiment of the present invention, a comparison of the weak driver signal value and the strong driver value provides an indication of a keypad switch activation. In another exemplary implementation, a comparison of a resulting signal value during two sample cycles ~~are compared~~ is performed. In one exemplary implementation, the random values in the register file are updated at random times or by significant events such as ~~keypresses~~ <u>key presses</u>.

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At page 13-14, lines 24-25 and 1-16 respectively, please amend the paragraph at page 14, line 4, and insert a comma at line 15:

Keypad matrix 230 is defined by two sets of matrix attributes, rows and columns. Each intersection of a first set matrix attribute and a second set matrix attribute (*e.g.*, the intersection of a row and column) includes a switch. To establish a preliminary keypad state, a strong signal at a varying logical value is applied to the first set of matrix attributes (*e.g.*, the columns) and a weak ~~week~~ signal at another logical value is applied to the second set of matrix attributes (*e.g.*, the rows). When a keypad switch at the intersection of two matrix attributes is activated, an electrical path is established between the first matrix attribute and the second matrix attribute (*e.g.*, between a row and column) and the strong signal overrides the weak signal. Each of the second set of matrix attributes (*e.g.*, the rows) is sampled and a determination is made if a strong signal has overcome a weak signal by analyzing if there is a change in the logical value of the weak signal on one of the second set of matrix attributes (*e.g.*, the rows). A change in the logical value indicates a switch on one of the second set of matrix attributes (*e.g.*, a row) is activated. After determining a switch on one of the second set of matrix attributes (*e.g.*, a row) is activated, an analysis is made regarding which of the first set of matrix attributes is associated with the active switch.

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At page 21-22, lines 16-24 and 1-8 respectively, please amend the paragraph at page 22, line 2 as follows:

The components of keypad security circuit 500 cooperatively operate to facilitate application of randomly varying keypad driver signals and increase the difficulty of interpreting electromagnetic emissions associated with keypad switch activation. A keypad register (e.g., keypad register 310) stores and forwards a varying register output signal (reg_out). Programmable column opposing signal constructor 520 and programmable row opposing signal constructor 525 determine if the varying register output signal is forwarded at the same logical value to a switch matrix (e.g., column or row) or if the signal is inverted first. Column static override circuit 590 and row static override circuit 595 determine if the varying register output signal is forwarded to [[t]] a switch matrix attribute or if a signal with a static logic value is forwarded. Column driver 550 and row driver 555 drive a column driver signal and a row driver signal onto a column and row respectively. Column precharge circuit 570 and row precharge circuit 575 hold a precharge when column driver 550 and row driver 555 are disabled respectively. Column comparator 510 and row comparator 515 compare the value of a driver signal sent out on a column or row with a logical value of a resulting keypad signal that is scanned from the column or row.

At page 36, lines 5-16, please amend the paragraph at lines 6 and 13 as follows:

In one embodiment of the present invention, a circuit is a 16-bit pseudo-random sequence generator (lfsr16_prn_r12) which provides the varying digital values sent to keypad switch matrix columns and rows. An active low asynchronous reset pin (CDN) is provided and is an acronym for "Clear Direct Not". Upon assertion of the CDN pin, the output of the flip-flops will go to 0x1. An active high pin such as a LFSR enable (LFSTEN) pin is provided and enables parallel data load capability. Parallel data load mode is selected if LOAD is high and the DATAIN pins (16-bit parallel data load input pins) are be provided. Some embodiments of the present invention have various LFSR operations with a specific order of precedence. In one exemplary implementation of the present invention async reset, parallel data load, lfsr enable is the order of precedence from high to low.

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At page 37, lines 6-15, please amend the paragraph as follows:

In step 810 a varying strong signal driver is <u>applied to</u> ~~driver onto~~ a first attribute of a keypad switch matrix. In one embodiment of the present invention, the first attribute of the keypad switch matrix is a column and in another embodiment it is a row. In one exemplary implementation of the present invention, the varying driver signal is one of a set of digital values that randomly varies over time and the bits in a digital keypad driver word. The varying strong driver signal is generated by a randomizer and loaded into a register file in one exemplary implementation of the present invention. The register file is updated at random times or by significant events such as <u>key presses</u> ~~keypresses~~.

At page 39, lines 1-2, please amend the paragraph as follows:

In step 850 a varying strong driver signal is <u>applied to</u> ~~driver onto~~ said second attribute of a keypad switch matrix.

At pages 40-41, lines and 1-5 respectively, please amend the paragraph as follows:

Some embodiments of keypad security method 800 include other features. One embodiment of keypad security method 800 includes a debounce step in which a resulting keypad signal is debounced before determining which keypad matrix switch is <u>activated</u> ~~activate~~. One exemplary implementation of the present invention utilizes a static signal to indicate whether static or varying driver signals are applied to the attributes of a keypad switch matrix.

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